CSE 8A Lecture 12

• Reading for next class: 8.1-8.3: Sounds!

• Today’s topics:
  – Logical Operators: ! && |||

• Start PSA 6: Chromakey!
Review: If-statements

Which statement is most true about ONE execution of this code?

```java
if (Math.abs(topAv - botAv) < 10)
    topP.setColor(Color.WHITE);
else
    topP.setColor(Color.BLACK);
```

A. It is possible BOTH Section A AND Section B will be executed

B. Either Section A will be executed, OR Section B will be executed, but NOT BOTH

C. It is possible neither Section A nor Section B will be executed.
Review: If-statements

Which statement is most true about ONE execution of this code?

```java
if (Math.abs(topAv - botAv) < 10)
    topP.setColor(Color.WHITE);
else if (Math.abs(topAv - botAv < 50)
    topP.setColor(Color.GREY);
else
    topP.setColor(Color.BLACK);
```

A. Exactly one of Section A, Section B, or Section C will be executed

B. It is possible that both Section B and Section C will be executed

C. It is possible that both Section A and Section C will be executed

D. It’s possible Sections A, B, and C will be executed

Confused? See page 187 for execution flow diagram
If-statements and pretty pictures
Chromakey: Visit strange new places

1) Solo: (30 sec)
2) Discuss/Group: (2 min)

In order to create/modify “the person picture” so that it looks like “the after Picture”, from which pictures do you take the pixels in the boxes?

A. Box 1 (yellow) from background, box 2 (green) from person
B. Box 1 from background, box 2 from background
C. Box 1 from person, box 2 from person
D. Box 1 from person, box 2 from background
E. None of the above
How will you know which part (yellow box or green) you are in?

A. Condition on the Pixel coordinates (not the color)

B. Condition on the Pixel colors in background

C. Depends on the Pixel colors in person

D. Depends on the Pixel colors in background, compared to those at the same coordinates in person

1) Solo: (30 sec)
2) Discuss/Group: (30 sec)
Your chromakey

• Call two chromakey methods:
  – One to replace background
  – One to replace t-Shirt
  – If there are 2 or more people in the picture, you can call more methods – one to replace each t-Shirt with a different background if you like

```java
public void chromaKeyBlue( Picture newPicToReplaceBlue, 
                          int blueThreshold )
    for( int x = 0; x < this.getWidth(); x++ )
        for( int y = 0; y < this.getHeight(); y++ )
            {
               //Do some stuff
               
```

OK to edit pictures before the code runs
Review: If-statements

2. What does the code above print?
   A. 7    B. 6    C. 7    D. other
   7       7       10
Review: If-statements

```java
int x = 4;

if( --x < 4 )
    if ( x++ > 3 )
    {
        x += 3;
        System.out.println( x );
    }
else
    System.out.println( x );
```

2. What does the code above print?

A. 3
B. 6
C. 7
D. other
Review: If-statements

```java
int x = 4;

if( x-- < 5 )
    if( x++ > 4 )
        System.out.println( x += 3 );
    else if( 2 < x || x < 5 )
        x += 2;

System.out.println( x );
```

2. What does the code above print?
   A. 8       B. 6       C. 7       D. other
   8                 9
**LOGICAL OPERATORS**

- **boolean** data type has values: true or false

- **! NOT OPERATOR**
  
<table>
<thead>
<tr>
<th>Logical Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>!false</td>
<td>true</td>
</tr>
<tr>
<td>!true</td>
<td>false</td>
</tr>
</tbody>
</table>

- **|| OR OPERATOR**

<table>
<thead>
<tr>
<th>Logical Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>true</td>
<td></td>
</tr>
<tr>
<td>true</td>
<td></td>
</tr>
<tr>
<td>false</td>
<td></td>
</tr>
<tr>
<td>false</td>
<td></td>
</tr>
</tbody>
</table>

- **&& AND OPERATOR**

<table>
<thead>
<tr>
<th>Logical Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>true &amp;&amp; true</td>
<td>true</td>
</tr>
<tr>
<td>true &amp;&amp; false</td>
<td>false</td>
</tr>
<tr>
<td>false &amp;&amp; true</td>
<td>false</td>
</tr>
<tr>
<td>false &amp;&amp; false</td>
<td>false</td>
</tr>
</tbody>
</table>
What line of code goes in the blank?

public static boolean isValid( int n, int min, int max )
{
    if( (min < n) || (n < max) )
        return true;
    else
        // Necessary?
        return false;
}

A. ||
B. &&
C. other
Which of the following is equivalent to the above code?

A.  return absValZ;
B.  return absValZ < 2.0;
C.  return absValZ >= 2.0;
D.  None of these
What line of code goes in the blank?

```java
public static boolean isAlpha( char ch )
{
    if( ('A' < ch ) ___(1)____ ch < 'Z')
        ___(2)___
        ___(2)___
        ('a' < ch ___(3)____ ch < 'z') )
        return true;
    else
        // Necessary?
        return false;
}
```

A. && && &&

B. && || &&

C. || && ||

D. other
1) Solo: (30 sec)
2) Discuss/Group: (1 min)

2. What does the code above print?
   A. 4    B. 3    C. 3    D. other
   3       2       2
   2       1       2

```java
int x = 6;

while( --x > 2 )
    System.out.println( x - 2 );

System.out.println( x );
```
2. What does the code above print?

A. hi     B. bye     C. hi     D. other
bye         hi
2. What does the code above print?

A. hi  B. bye  C. hi  D. other
bye  hi
public static void readValidAge() {
    int age;
    Scanner scan = new Scanner(System.in);  // Keyboard input
    do {
        System.out.print("Enter your age: ");
        age = scan.nextInt();
    } while( _______(1)_______ );
}

A. (age > 0) || (123 > age)

B. (age < 0) || (123 < age)

C. (age < 0) && (123 < age)

D. other
What line of code goes in the blank?

```java
public static void main( String [] args )
{
    int answer;
    Scanner scan = new Scanner(System.in);  // Keyboard input
do
    {
        /* Some code here */
        System.out.print("Want to repeat program (1:yes  2:no  3:NO)? ");
        answer = scan.nextInt();
    } while( ______(1)_______ );
}
```

A. (answer != 2) || (answer != 3)
B. answer != 1
C. (answer != 2) && (answer != 3)
D. other
Summary of Concepts

• if-statements
• Logical Operators
• Loops Review
TODO

• Reading for next class: 8.1-8.3 (Sounds)
• Start PSA6